

Managed Fast/Gigabit Ethernet Switches Premium Line

IE-SW-PL10M Series (from product Rev. 2.0.0)

Hardware Installation Guide

Sixth Edition, August 2018
124340000/05/08.18

Important note:

This document, the detailed user manual, additional product information, configuration tool and latest firmware can be downloaded using following link:

<http://www.weidmueller.com>

► Select **Product Catalogue**

- ⇒ Select „Active Industrial Ethernet“
 - ⇒ Select „PremiumLine managed Switches“
 - ⇒ Select Product model
 - ⇒ Click and expand section „Downloads“
 - ⇒ Download needed software or documentation

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Weidmüller 

Package Checklist

Your Ethernet switch is shipped with the following items. If any of these items is missing or damaged, please contact your Weidmüller customer service for assistance.

- 1 Ethernet Switch of IE-SW-PL10M series
- Hardware Installation Guide (printed)
- RJ45 to DB9 console port cable
- Protective caps for unused ports

Regarding further documentation like the manual please download it from the Weidmüller product catalogue as described on page 1.

Optional Accessories (must be ordered separately)

- **IE-SFP-1GSXLC Art.No.: 1241490000**
(SFP transceiver with 1000BaseSX, LC, 0.5km, 0 to 60°C)
- **IE-SFP-1GSXLC-T Art.No.: 1286700000**
(SFP transceiver with 1000BaseSX, LC, 0.5km, -40 to 85°C)
- **IE-SFP-1GLSXLC Art.No.: 1241500000**
(SFP transceiver with 1000BaseLSX, LC, 2km, 0 to 60°C)
- **IE-SFP-1GLSXLC-T Art.No.: 1286710000**
(SFP transceiver with 1000BaseLSX, LC, 2km, -40 to 85°C)
- **IE-SFP-1GLXLC Art.No.: 1241510000**
(SFP transceiver with 1000BaseLX, LC, 10km, 0 to 60°C)
- **IE-SFP-1GLXLC-T Art.No.: 1286720000**
(SFP transceiver with 1000BaseLX, LC, 10km, -40 to 85°C)
- **IE-SFP-1GLHXLC Art.No.: 1241520000**
(SFP transceiver with 1000BaseLHX, LC, 40km, 0 to 60°C)
- **IE-SFP-1GLHXLC-T Art.No.: 1286730000**
(SFP transceiver with 1000BaseLHX, LC, 40km, -40 to 85°C)
- **EBR-MODULE RS232 Art.No.: 1241430000**
(External module for backing up and restoring the configuration via Switch's RS-232 Console Port)
- **RM-KIT Art.No.: 1241440000**
(Kit for 19"-rack mounting)
- **IE-WALLMOUNT-KIT-46MM Art.No.: 1504440000**
(Kit for wall mounting)



Brief Information for quick access to the Web interface

The Web interface of the managed Switch can be accessed via IP address 192.168.1.110 and subnet mask 255.255.255.0 (Factory default value).

Connect the PC to any port of the managed Switch and set the PC's IP address to a free one of range 192.168.1.0 / 255.255.255.0

Start a web browser and enter the IP address of the connected Switch into the browser's address line.

<http://192.168.1.110>

After the appearance of the login prompt, please enter following login data (factory settings):

User name: **admin**
Password: **Detmold**

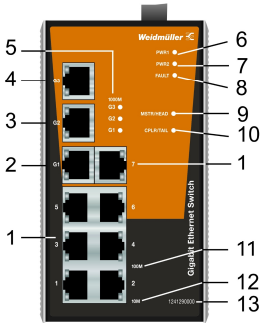
Note: The Web interface uses Java Runtime applets for displaying some Switch parameters. For this reason your PC must have installed the Java Runtime Engine to be able to configure the Switch without any limitations.

For general settings of the Switch parameters please refer to the manual.

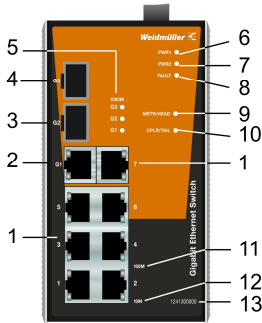
Panel Layout of IE-SW-PL10M-series

Front Panel View

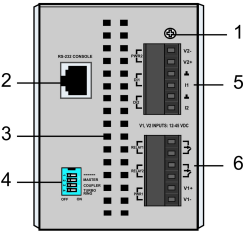
IE-SW-PL10M(T)-3GT-7TX



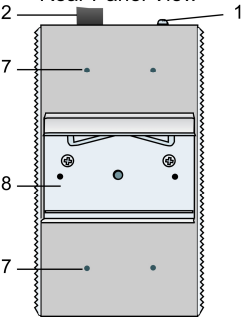
IE-SW-PL10M(T)-1GT-2GS-7TX



Top Panel View



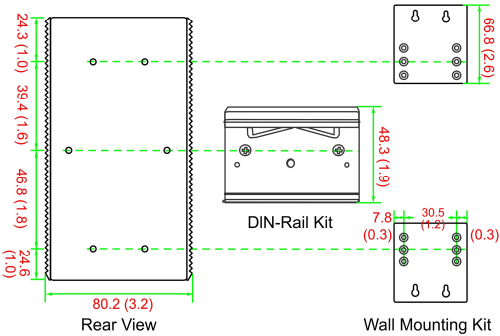
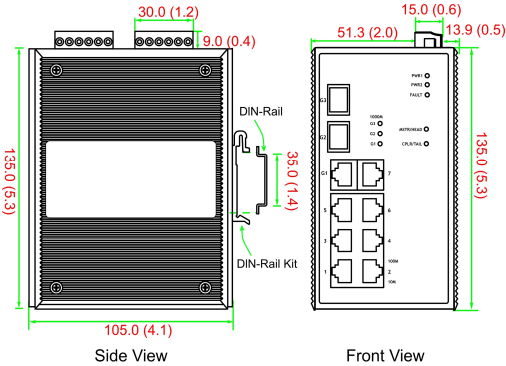
Rear Panel View



- 1) 1 to 7 10/100BaseT(X) ports
- 2) G1 → 10/100/1000BaseT(X) port
- 3) G2 → IE-SW-PL10M(T)-3GT-7TX = 10/100/1000BaseT(X) port, IE-SW-PL10M(T)-1GT-2GS-7TX = 1000BaseSFP port
- 4) G3 → IE-SW-PL10M(T)-3GT-7TX = 10/100/1000BaseT(X) port, IE-SW-PL10M(T)-1GT-2GS-7TX = 1000BaseSFP port
- 5) G1, G2, G3: LED indicators for 1000 Mbps ports
- 6) PWR1: LED for power input 1
- 7) PWR2: LED for power input 2
- 8) FAULT: LED indicator
- 9) MSTR/HEAD: LED indicator
- 10) CPLR/TAIL: LED indicator
- 11) 100M: LED indicator for TP port
- 12) 10M: LED indicator for TP port
- 13) Article Number

Mounting Dimensions

Units: mm (inch)



DIN-Rail Mounting

The aluminum DIN-Rail clip should already be fixed to the back panel of the Ethernet Switch when you take it out of the box. If you need to reattach the DIN-Rail clip, make sure the stiff metal spring is situated towards the top, as shown in the following figures.

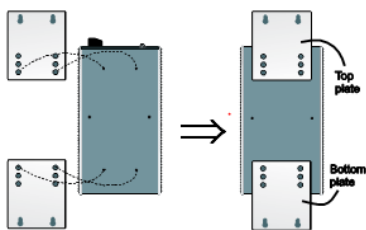
STEP 1: Insert the top of the DIN-Rail into the slot just below the stiff metal spring.	STEP 2: The DIN-Rail attachment unit will snap into place as shown below.
<p>metal spring</p> <p>DIN-Rail</p>	<p>metal spring</p> <p>DIN-Rail</p>

To remove the device from the DIN-Rail, simply reverse Steps 1 and 2.

Wall Mounting (optional)

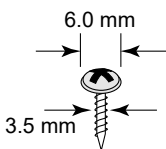
For some applications, you will find it convenient to mount the Ethernet switch on the wall, as shown in the following figures.

STEP 1: Remove the aluminum DIN-Rail attachment plate from the switch rear panel, and then attach the wall mount plates as shown in the diagram at the right.



STEP 2:

Mounting the switch on the wall requires 4 screws. Use the switch, with wall mount plates attached, as a guide to mark the correct locations of the 4 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure at the right.



NOTE Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the wall mounting plates.

Do not screw the screws in completely—leave about 2 mm to allow room for sliding the wall mount panel between the wall and the screws

STEP 3:

Once the screws are fixed on the wall, insert the four screw heads through the large parts of the keyhole-shaped apertures, and then slide the switch downwards, as indicated. Tighten the four screws for added stability.

ATEX Information



1. Certificate number DEMKO 11 ATEX 150190X
2. Ambient range: $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq 75^{\circ}\text{C}$
3. Certification string: Ex nA nC IIC T4 Gc
4. Standards covered:
EN 60079-0:2012+A11:2013, EN 60079-15:2010
5. The conditions of safe usage:
 - These products must be mounted in an IP54 enclosure
 - Install in an area of pollution degree 2 or less
 - Use a conductor wire of size 0.2 mm^2 or greater
 - PROVISIONS SHOULD BE MADE, EXTERNAL TO THE APPARATUS, TO PREVENT THE RATED VOLTAGE FROM BEING EXCEEDED BY TRANSIENT DISTURBANCES OF MORE THAN 40 %.

Wiring Requirements



WARNING

Do not disconnect modules or wires unless the power supply has been switched off or the area is known to be non-hazardous. The devices may only be connected to the supply voltage shown on the type plate.

The devices are designed for operation with a Safety Extra-Low Voltage. Thus, they may only be connected to the supply voltage connections and to the signal contact with the Safety Extra-Low Voltages (SELV) in compliance with IEC950/ EN60950/ VDE0805.



WARNING

This unit is a built-in type. When the unit is installed in another piece of equipment, the equipment enclosing the unit must comply with fire enclosure regulation IEC 60950/EN60950 (or similar regulation).



WARNING

Safety First!

Be sure to disconnect the power cord before installing and/or wiring the Ethernet Switch.

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Please read and follow the guidelines:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
NOTE: Do not run signal or communications wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring with similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring for all devices in the system when necessary.

Grounding the Ethernet Switch

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

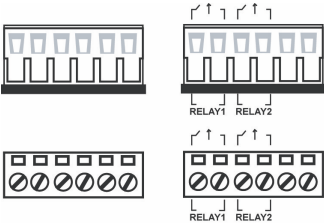


ATTENTION

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

Wiring the Relay Contact

The Ethernet Switch has two sets of relay outputs—relay 1 and relay 2. Each relay contact uses two contacts of the terminal block on the Switch’s top panel. Refer to the next section for detailed instructions on how to connect the wires to the terminal block connector and how to attach the terminal block connector to the terminal block receptor. In this section, we illustrate the meaning of the two contacts used to connect the relay contact.

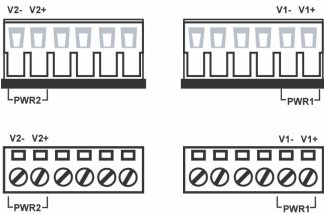


FAULT:

The two sets of relay contacts of the 6-pin terminal block connector are used to detect user-configured events. The two wires attached to the fault contacts form an open circuit when a user-configured event is triggered. If a user-configured event does not occur, the fault circuit remains closed.

Wiring the Redundant Power Inputs

The Ethernet Switch has two sets of power inputs—power input 1 and power input 2. The top two contacts and the bottom two contacts of the 6-pin terminal block connectors on the Switch’s top panel are used for the two power inputs. Input Terminal Block is rated 300 V/15 A, is soldered on the board, can mate with a plug-half connector suitable for 28-12 AWG wire size, and has a torque value of 4.5-5.0 lb-in. The plug-half connection has latching mechanism. The top and front views of one of the terminal block connectors are shown here.



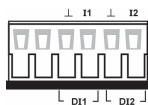
STEP 1: Insert the negative/positive DC wires into the V-/V+ terminals, respectively.

STEP 2: To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the Switch’s top panel.

Wiring the Digital Inputs

The Ethernet Switch has two sets of digital inputs, DI 1 and DI 2. Each DI consists of two contacts of the 6-pin terminal block connector on the Switch's top panel. The top and front views of one of the terminal block connectors are shown here.



STEP 1: Insert the negative (ground)/positive DI wires into the I1/I2 terminals, respectively.

STEP 2: To keep the DI wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the Switch's top panel.

Communication Connections

Each switch of IE-SW-PL10M series has 3 types of communication ports:

- 1 RJ45 console port (RS-232 interface)
- 7 10/100BaseTX Ethernet ports
- 3 Gigabit Ethernet ports:
 - 3 10/100/1000BaseTX ports, or 1 10/100/1000BaseTX and 2 1000BaseSFP (mini-GBIC) ports
-

In this section, we present two types of diagrams—Pinout Diagrams and Cable Wiring Diagrams—that convey information about the ports and the cables used to connect the Ethernet Switch to other devices:

Pinouts: The “Pinouts” diagrams display the type of signal passing through each of the port's pins.

Cable Wiring: The “Cable Wiring” diagrams present standard cable wiring schemes for cables used to connect the Switch's ports to other devices. These diagrams display three pieces of information:

1. When building your own cable, refer to the “**pin-to-pin**” cable wiring information displayed between the two vertical dashed lines to see which pin of the connector on the left should be connected to which pin of the connector on the right.
2. The information to the left of the left vertical dashed lines gives the pinouts of the relevant Ethernet Switch port.
3. The information to the right of the right vertical dashed line gives the pinouts of the opposing device's port.

10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on the Switch’s front panel are used to connect to Ethernet-enabled devices. Most users configure these ports for Auto MDI/MDI-X mode, in which case the port’s pinouts are adjusted automatically depending on the type of Ethernet cable used (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.

In what follows, we give pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports. We also give cable wiring diagrams for straight-through and cross-over Ethernet cables.

10/100Base T(x) RJ45 Pinouts

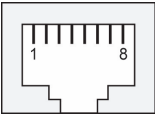
MDI Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

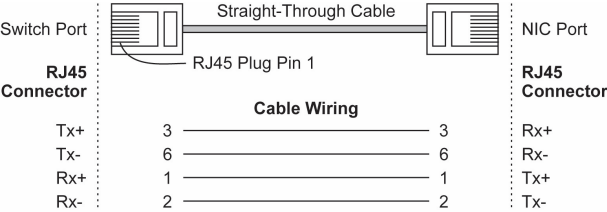
MDI-X Port Pinouts

Pin	Signal
1	Rx+
2	Rx-
3	Tx+
6	Tx-

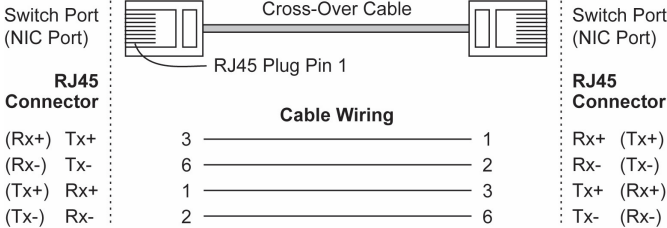
8-pin RJ45



RJ45 (8-pin) to RJ45 (8-pin) Straight-through Cable Wiring



RJ45 (8-pin) to RJ45 (8-pin) Cross-over Cable Wiring

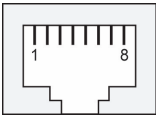


1000BaseT Ethernet Port Connection

1000BaseT data is transmitted on differential TRD+/- signal pairs over copper wires.

MDI/MDI-X Port Pinouts

Pin	Signal
1	TRD(0)+
2	TRD(0)-
3	TRD(1)+
4	TRD(2)+
5	TRD(2)-
6	TRD(1)-
7	TRD(3)+
8	TRD(3)-



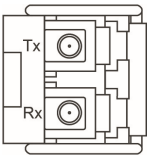
1000BaseSFP (mini-GBIC) Fiber Port

The Fiber optic ports on the IE-SW-PL10M(T)-1GT-2GS-7TX are SFP type slots, which require 1000BaseSFP mini-GBIC fiber transceivers to work properly. Weidmüller provides transceiver models for various distance requirements.

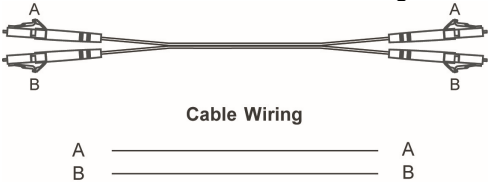
The concept behind the LC port and cable is quite straightforward. Suppose that you are connecting devices I and II; contrary to electrical signals, optical signals do not require a circuit in order to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used transmit data from device II to device I, for full-duplex transmission.

Remember to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you make your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A and B-to-B, as shown below, or A1-to-A2 and B1-to-B2).

LC-Port Pinouts



LC-Port to LC-Port Cable Wiring



ATTENTION

This is a Class 1 Laser/LED product. To avoid causing serious damage to your eyes, do not stare directly into the Laser Beam.

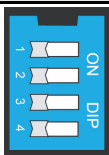
Turbo Ring DIP Switch Settings

Switches of IE-SW-PL10M series are managed Ethernet switches that offer redundancy. The proprietary Turbo Ring protocol provides better network reliability and faster recovery time. Turbo Ring's recovery time is less than 300 ms (**Turbo Ring**) or 20 ms (**Turbo Ring V2**) - compared to a 3- to 5-minute recovery time for commercial switches - decreasing the possible loss caused by network failures in an industrial setting.

There are 4 Hardware DIP Switches for Turbo Ring on the top panel of the Switch that can help setup the Turbo Ring easily within seconds. If you do not want to use a hardware DIP switch to setup the Turbo Ring, you can use a web browser, telnet, or console to disable this function.

NOTE Please refer to the **Turbo Ring DIP Switch** section and **Using Communication Redundancy** section in User's Manual for more detailed information about the settings and usage of **Turbo Ring** and **Turbo Ring V2**.

IE-SW-PL10M series DIP Switches



MASTER
COUPLER
TURBO
RING

The default setting for each DIP Switch is OFF. The following table explains the effect of setting the DIP Switch to the ON position.

"Turbo Ring" DIP Switch Settings

DIP 1	DIP 2	DIP 3	DIP 4
Reserved for future use.	<u>ON</u> : Enables this Ethernet Switch as the Ring Master.	<u>ON</u> : Enables the default "Ring Coupling" ports.	<u>ON</u> : Activates DIP switches 1, 2, 3 to configure "Turbo Ring" settings.
	<u>OFF</u> : This Ethernet Switch will not be the Ring Master.	<u>OFF</u> : Do not use this Ethernet Switch as the ring coupler.	<u>OFF</u> : DIP switches 1, 2, 3 will be disabled.

"Turbo Ring V2" DIP Switch Settings

DIP 1	DIP 2	DIP 3	DIP 4
<u>ON</u> : Enables the default "Ring Coupling (backup)" port.	<u>ON</u> : Enables this Ethernet Switch as the Ring Master.	<u>ON</u> : Enables the default "Ring Coupling" port.	<u>ON</u> : Activates DIP switches 1, 2, 3 to configure "Turbo Ring V2" settings.
<u>OFF</u> : Enables the default "Ring Coupling (primary)" port.	<u>OFF</u> : This Ethernet Switch will not be the Ring Master.	<u>OFF</u> : Do not use this Ethernet Switch as a ring coupler.	<u>OFF</u> : DIP switches 1, 2, 3 will be disabled.

NOTE You must enable the Turbo Ring function first (DIP 4) before using the DIP switches to activate the Master and Coupler functions.

NOTE If you do not enable any of the IE-SW-PL10M switches to be the Ring Master, the Turbo Ring protocol will automatically choose the switch with the smallest MAC address to be the Ring Master. If you accidentally enable more than one IE-SW-PL-10M switch to be the Ring Master, these switches will auto-negotiate to determine which one will be the Ring Master.

LED Indicators

There are several LEDs on the Ethernet Switches front panel. The function of each LED is described in the following table.

LED	Color	State	Description
PWR1	AMBER	On	Power is being supplied to power input PWR1.
		Off	Power is not being supplied to power input PWR1.
PWR2	AMBER	On	Power is being supplied to power input PWR2.
		Off	Power is not being supplied to power input PWR2.
FAULT	RED	On	When (1) a relay warning event is triggered, (2) the switch is the Master of this Turbo Ring, and the Turbo Ring is broken, or (3) start-up failure.
		Off	When a relay warning event is not triggered.
MSTR/ HEAD	GREEN	On	When the switch is set as the Master of the Turbo Ring, or as the Head of the Turbo Chain.
		Blinking	The switch has become the Ring Master of the Turbo Ring, or the Head of the Turbo Chain, after the Turbo Ring or the Turbo Chain is down.
		Off	When the switch is not the Master of this Turbo Ring or is set as the Member of the Turbo Chain.

CPLR/ TAIL	GREEN	On	When the switch coupling function is enabled to form a back-up path, or when it's set as the Tail of the Turbo Chain.
		Blinking	When the Turbo Chain is down.
		Off	When the switch disables the coupling function, or is set as the Member of the Turbo Chain.
10M (TP)	GREEN	On	TP port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	TP Port's 10 Mbps link is inactive.
100M (TP)	GREEN	On	TP port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	TP Port's 100 Mbps link is inactive.
1000M (TP/SFP)	GREEN	On	TP/SFP port's 1000 Mbps is active.
		Blinking	Data is being transmitted at 1000 Mbps.
		Off	TP/SFP port's 1000 Mbps link is inactive.

Specifications

Technology	
Standards	IEEE802.3, 802.3u, 802.3x, 802.1D-2004, 802.1Q, 802.1w, 802.1p, 802.1X, 802.3ad, 802.3z
Protocols	IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, LLDP, IEEE 1588 PTP, IPv6, Modbus/TCP, Ethernet/IP, PROFINET RT
MIB	MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, RMON MIB Group 1, 2, 3, 9, Bridge MIB, RSTP MIB
Interface	
RJ45 Ports	10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Ports	optional 1000BaseSX/LSX//LX/LHX (LC connector)
Console	RS-232 (10-pin RJ45)
LED Indicators	PWR1, PWR2, FAULT, 10/100M (TP-port), 1000M (TP/SFP-port), CPLR/TAIL, MSTR/HEAD
Relay Contact	Two relay outputs with current carrying capacity of 1A @ 24 VDC
Digital Input	Two inputs with the same ground, but electrically isolated from the electronics <ul style="list-style-type: none"> • For state "1": +13 to +30V • For state "0": -30 to +3V • Max. input current: 8 mA
DIP Switches	Master, Coupler, Turbo Ring, Reserve

Power	
Input Voltage	24 VDC (12 to 45 VDC), 2 redundant inputs
Input Current (@24V)	IE-SW-PL10M(T)-3GT-7TX: 0.48 A IE-SW-PL10M(T)-1GT-2GS-7TX: 0.38 A
Connection	Two removable 6-pin terminal blocks
Overload Current Protection	Present
Reverse Polarity Protection	Present
Mechanical	
Housing	Metal, IP30 protected
Dimensions (W × H × D)	80.5 × 135 × 105 mm
Weight	1170 g
Installation	DIN-Rail, Wall Mounting (optional kit)
Environment	
Operating Temperature	Standard models: -10 to 60°C (14 to 140°F) Wide temp. models: -40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5% to 95% (non-condensing)
Regulatory Approvals	
Safety	UL 508, CSA C22.2 No. 60950-1, UL 60950-1, EN60950-1
Hazardous Location	UL/cUL Class I, Division 2, Groups A, B, C, and D ATEX Zone 2: Ex nA nC IIC T4 Gc
EMC	EN 55032 Class A CISPR 32, FCC Part 15B Class A IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80MHz to 1GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10V IEC 61000-4-8
Shock	IEC60068-2-27
Freefall	IEC60068-2-31
Vibration	IEC60068-2-6
MTBF (mean time between failures)	
Time	977,099 hrs
Database	Telcordia (Bellcore), GB 25°C
WARRANTY	
Time Period	5 years

**WARNING**

This equipment is intended to be used in a restricted access location.

HOT SURFACE!! Before touching it, special attention or protection is required.

Weidmüller gives a 5-year warranty on this product in accordance with the warranty terms as described in the general conditions of sale of the Weidmüller company which has sold the products to you. Weidmüller warrants to you that such products the defects of which have already existed at the time when the risk passed will be repaired by Weidmüller free of charge or that Weidmüller will provide a new, functionally equivalent product to replace the defective one. Safe where expressly described otherwise in writing in this catalogue/product description, Weidmüller gives no warranty or guarantee as to the interoperability in specific systems or as to the fitness for any particular purpose. To the extent permitted by law, any claims for damages and reimbursement of expenses, based on whatever legal reason, including contract or tort, shall be excluded. Where not expressly stated otherwise in this warranty, the general conditions of purchase and the expressive liability commitments therein of the respective Weidmüller company which has sold the products to you shall be applicable.

Contact Information

Weidmüller Interface GmbH & Co. KG
Postfach 3030
32760 Detmold
Klingenbergstraße 16
32758 Detmold
Germany

Phone +49 (0) 5231 14-0
Fax +49 (0) 5231 14-292083
E-Mail info@weidmueller.com
Internet www.weidmueller.com